INTERVIEW SUMMARY

Applicants would like to thank Examiner Yang for the courtesies he extended them and their attorney in the personal interview conducted on October 17, 2006. In the interview the Applicants demonstrated an exemplary embodiment of the present invention and they and their attorney discussed the term "optimal viewing point" with Examiner Yang in connection with the cited prior art. Applicants explained how the optimum viewing point is an actual defined point, not a general region of some associated structure as in the Fleury reference. Examiner Yang indicated that he would consider further amendments clarifying this term, subject to further searching.

REMARKS

Claims 1-35 were pending in the application. Independent claims 1, 28, 30 and 32 have been amended to further clarify Applicants' invention, as discussed in the interview with Examiner Yang. New independent claims 38-39 have been added. Claims 11, 17, 23, 27, 29, 31, 33 and 36 have been amended stylistically. New claim 38 is at least supported by ¶¶ 70-71 of the specification, and claim 39 is a rewrite of claim 36. Thus, no new matter has been added. The following remarks, in conjunction with the above presented amendments, are believed to be fully responsive to the Office Action mailed on June 23, 2006 (the "Office Action") in this application. Claims 1, 28, 30, 32, 38 and 39 are the independent claims. Favorable reconsideration is requested.

Rejection of Claims 1-37 Under 35 U.S.C. 103(a)

Claims 1-37 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5, 963, 213 to Guedalia ("Guedalia") in view of the United States Published Patent Application No. 2003/0043170 to Fluery ("Fleury"). This rejection is articulated relative to claim 1 at pages 2-3 of the Final Office Action. Similarly rejections are maintained against the remaining independent claims.

In the Final Office Action, the Examiner initially read Guedalia on all of the elements of claim 1 including automatically moving the model zoom point from its original position towards an optimum viewing point. Nonetheless, in the next paragraph (top of page 3 of the Final Office Action), the Examiner admits that Guedalia does not specifically disclose "an optimum viewing point". Rather, such limitation is asserted in the Final Office Action as being shown in the teaching of Fluery, as taught by the language "restricting a point of interest within a view window during the process of viewing." Final Office Action at 3.

As is described in the specification, the present invention is directed to three-dimensional interactive displays of 3D datasets. Specification at ¶ 40. In any such display system there are portions of the screen which systems and application designers, as well as users tend to regard as more optimum than others. In general, the center of a screen or a "sweet spot" nearby it are considered optimum viewing points inasmuch as a user seated directly in front of the display screen tends to look at such points most comfortably. Or, for example, in a system that utilizes a stereoscopic display so as to better present depth cues to a user, there is a definite point or points at which stereo convergence is better than other points, and a given user, system or application utilizing stereoscopic display can, for example, set such a point as an optimum viewing point.

Further, as described in the specification, when viewing a 3D dataset, if users wish to examine a portion of it in detail, such as via a scaling or zoom operation, such users find it natural and comfortable to examine such a region of interest, once zoomed or magnified, with the center of zoom at just such an optimum viewing point, even if the zoom operation was initiated using a model zoom point far away from the optimum viewing point, such as on an object way back in the data set.

Thus, claim 1 as amended recites a method for controlling the scaling of a 3D computer model in a 3D display system. The claimed method includes activating a zoom mode, selecting a model zoom point, and setting a zoom scale factor. The method further includes implementing the zoom operation and automatically moving the model zoom point from its original position towards a system, application or user defined optimum viewing point in response to the selected model zoom point and the set scale factor. In contrast to generally restricting a point of interest "within a view window" as in Fleury, the claimed optimum viewing point is an actual defined point in the display space. It can be defined by, for example, a system, a given application, or a user within a given application, and can be, for example, the center of the display screen, or, for example, a point of most comfortable stereoscopic convergence.

As described in the specification, in a zoom operation, where the center of scaling or model zoom point, is ***not*** the optimum viewing point, as defined by the system, an application, or a user, a situation as depicted in Fig. 2B of the specification can occur. In such a situation the center of the zoomed object can undesirably translate within the display space as a result of the zoom operation being centered at point 201, whose (x,y,z) co-ordinates are not equal to (0,0,0), the system defined optimum viewing point in this example. *Specification* at ¶ 49. This

motion of the model under examination can be disconcerting to a user, as some or most of the model under examination can move out of an optimum viewing area of the display screen. One conventional way to ameliorate this problem is to only allow zooming operations when the model zoom point is precisely at the optimum viewing point. However, this imposes counter-intuitive constraints on a user while examining a model.

In exemplary embodiments of the present invention this problem can be solved by automatically moving the center of scaling to a defined optimum viewing point as the zoom operation is implemented. *Specification* at ¶¶ 85-89. Such translation can be a function of the scaling factor λ. *Id.* Thus, a user sees the model being zoomed and at the same time sees the model moving to a defined optimum viewing point. This adds to a user's comfort and convenience in examining a model. *Specification* at ¶ 86. The user is free to choose any point in the model as a model zoom point, and at the same time the system can automatically make that chosen point to lie at the defined optimum viewing point to provide maximum viewing comfort and convenience. *Id.* The automatic motion can be according to a defined algorithm, for example, a function of the distance between the chosen model zoom point and the optimum viewing point and the scaling factor λ. *Id.*

Guedalia is directed to two-dimensional images. In particular, a method of displaying a cylindrical source image, such as a "cylindrical panorama", onto a flat plane. This involves mapping pixels form the curved source image to a view plane according to certain rules. Guedalia describes conventional 2D zoom operations in that context. On page 3 of the Final Office Action the Examiner first alleges that Guedalia at 3:7-19, 3:35-48, and 12:46-57 describes automatically moving a model zoom point from its original position towards an optimum viewing point. Respectfully, none of these citations have anything to do with moving

the center of scaling within a display space or with optimum viewing points, and the Examiner explicitly admits in the next paragraph that Guedalia does not disclose the term or the concept "optimum viewing point." Thus, Guedalia cannot teach implementing a zoom operation and automatically moving the model zoom point from its original position towards a system, application or user defined optimum viewing point, as is recited in claim 1 and the remaining independent claims.

Fleury describes navigating in a multi-scale 3D scene, such as a virtual oil well. It describes assigning reference shapes to 3D models. Fleury at ¶ 21. These shapes track the motion of 3D model objects. *Id.* Further, the Fleury system restricts the motion of the points of interest ("POI") within the 3D models to be ***within the associated reference shape***. Fleury addresses a problem unique to less than optimal 3D visualization systems. The user cannot accurately choose a model zoom point (or model "pivot point") in 3D so it uses a 2D approximation. (It is noted that claim 1 of the present application is directed to model zoom points being selected in 3D, and thus the problem sought to be solved by Fleury does not arise). The approximation error exacerbates when a significant zoom is implemented, and the actual center of scaling, not even being on the 3D model object, causes some of the model to move out of view. Fleury at ¶¶ 3-5 and Figs. 1. Fleury solves the problem by associating a reference object, such as a virtual wire, as shown in Fig. 2, with the 3D object and restricts any operation on the 3D object to be implemented on a POI ***contained in the reference object***. When a user implements a translation, rotation or zoom, the POI is moved along the reference shape.

However, Fleury is completely silent as to defining an optimum viewing point, or why some points are more optimal than others, and Fleury is also completely silent as to automatically moving a model zoom point within the display space to such an optimum

viewing point concurrent with a zoom operation so as to provide a user with maximal viewing comfort. The claimed method of the present invention is simply not concerned with keeping a point of interest of a model within a certain associated "reference shape" so as not to lose the model from view, but rather with allowing every zoom operation to zoom about the defined optimum viewing point so as to maximize the user's viewing comfort.

The method of claim 1 allows a user to freely choose a model zoom point anywhere in the model space and then automatically move such model zoom point to a system, application or user defined optimal viewing point for him. Thus, claim 1 and related independent claims 28, 30 and 32 are urged as patentable over Guedalia and Fleury, whether alone or in combination.

For similar reasons, new claims 38 and 39, and each of the remaining dependent claims are also urged as patentable over these references as well.

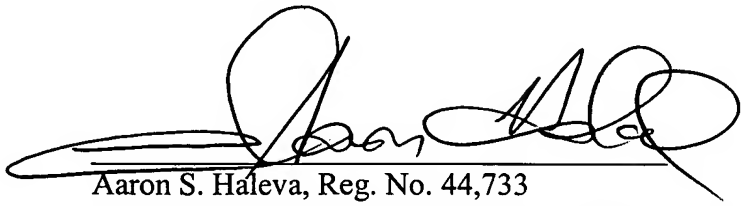
If any issues remain open, or if the distinction between the cited prior art and the pending claims is not seen as sufficiently clear, Applicants respectfully request a telephonic conference with the Examiner to hopefully resolve any remaining issues.

No other fee is believed to be due in connection with the submission of these papers.

However, the Commissioner is hereby authorized to charge any fee deficiency or credit any overpayment to Deposit Account No. 50-0540.

Dated: **December 26, 2006**

Respectfully submitted,



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